

AMENDMENTS TO THE SPECIFICATION

Please insert the following paragraph prior to the BACKGROUND OF THE INVENTION section beginning on page 1, line 4:

a¹ This application is a continuation-in-part of copending U.S. Application Serial No. 09/313,268, filed May 18, 1999, now abandoned.

Please amend the paragraph beginning on page 8, line 18 as follows in marked-up form:

Referring to FIG. 2, the pump 10 having the supplemental outflow port 12 according to the present invention is illustrated in use as part of a pump and cannula arrangement for providing left-heart assist. More specifically, an inflow cannula 20 is coupled to the main inflow port 14, an outflow cannula 22 is coupled to the main outflow port 16, and a perfusion catheter or cannula 24 is coupled to the supplemental outflow port 12. The inflow cannula ~~22~~ 20 is dimensioned to extend through the wall of the left atrium such that its distal end is disposed within the left ventricle. The outflow cannula 22 is dimensioned to extend through the wall of the aorta. Under the direction of the pump 10, blood may thus be withdrawn from the left ventricle and re-directed into the aorta, effectively bypassing the aortic valve, as may be required for various cardiac surgery procedures. In accordance with one embodiment of the present invention, the perfusion catheter 24 is dimensioned to extend into a blood vessel 30 on the exterior of the heart. More specifically, with combined reference to FIGS. 2 and 3, the perfusion catheter 24 is preferable to be positioned within the blood vessel 30 such that the distal end 26 extends past a damaged or diseased section 32 of the blood vessel 30, which is to be bypassed (such as via a coronary artery bypass graph (CABG) procedure), removed, or otherwise treated. In practice, the target vessel 30 will be occluded upstream of the damaged or diseased section 32, the occlusion being shown generically at 40.

Please amend the paragraph beginning on page 10, line 12 as follows in marked-up form:

Q3 Although shown as part of a left-heart bypass arrangement in FIG. 2, it is to be readily understood that the pump 10 having the supplemental port 12 of the present invention may be used in any number of cannulation arrangements for cardiac surgery. These may include (but are not necessarily limited to) pump and cannula arrangements for providing left-heart and/or right-heart support, such as set forth in US. Patent Application Serial Number 08/891,456, now U.S. Patent No. 6,123,725 (assigned to the assignee of the present application and filed on July 11, 1997), the entire contents of which are hereby expressly incorporated herein by reference. When employed as part of a right-heart cannulation system, the pump 10 of the present invention would provide venous blood (withdrawn from the right side of the heart) through the supplemental port 12. Although this venous blood is (by definition) oxygen depleted, this blood supply may nonetheless be helpful in perfusing locations downstream from a surgical site, as even oxygen-depleted blood is better than no downstream blood flow at all. Moreover, while blood pump 10 is shown as a generic centrifugal blood pump, it is to be readily understood that blood pump 10 may comprise any number of blood pumps, including but not limited to the miniature centrifugal blood pump shown and described in U.S. Provisional Patent Application No. 60/178,479 (filed by the assignee of this application on January 26, 2000), the entire disclosure of which is hereby expressly incorporated herein by reference. It should also be appreciated that, although shown and described above in use with the perfusion catheter 24 for tissue perfusion, the supplemental outflow port 12 may have a variety of other uses. These may include (but are not necessarily limited to) use as a pressure tap to determine the pressure of the outflow from the pump 10, as well as for obtaining blood samples, such as for determining blood gas content.
